

**Temperature and Horizontal Wind Measurements on the ER-2
Aircraft during the 1987 Airborne Antarctic Ozone Experiment**

K. Roland Chan, Stan G. Scott, T. Paul Bui
NASA, Ames Research Center, Moffett Field, California

Stuart W. Bowen
San Jose State University, San Jose, California

and
Jon Day
I.M.I. Incorporated, Palo Alto, California

Abstract

The NASA ER-2 aircraft is equipped with special instrumentation to provide accurate in-situ measurement of the atmospheric state variables during flight. The Meteorological Measurement System (MMS) on the ER-2 aircraft is briefly described. Since the meteorological parameters (temperature, pressure, and wind vector) are extensively used by other ER-2 experimenters for data processing and interpretation, the accuracy and resolution of each of these parameters are assessed and discussed.

During the 1987 Airborne Antarctic Ozone Experiment (AAOE) mission, the ER-2 aircraft was stationed at Punta Arenas, Chile (53 S, 72 W), and successfully flew over Antarctica on 12 occasions between August 17 and September 22, 1987. On each of the 12 flights, the ER-2 aircraft flight plan was to take off at approximately the same local time, fly southward at a near constant potential temperature surface, descend and ascend at the southernmost terminus at about 72 S over Antarctica, and return northward at either the same or a different constant potential temperature surface.

The measurements of the MMS experiment during the AAOE mission are presented. MMS data are organized to provide a composite view of the polar atmosphere, which is characterized by frigid temperatures and high zonal winds. Altitudinal variations of the temperature measurement (during takeoff/landing at Punta Arenas and during descent/ascent at the southern terminus) and latitudinal variations of the zonal wind (on near constant potential temperature surfaces) are emphasized and discussed.